FOX 4G Matrix 3200

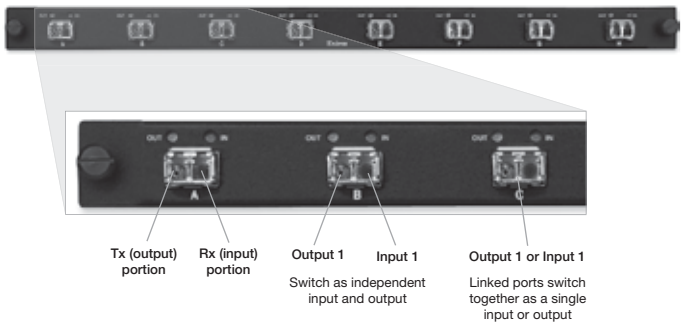
MODULAR FIBER OPTIC MATRIX SWITCHER FROM 8X8 TO 32X32

- I/O sizes from 8x8 to 32x32
- High speed digital switching - up to 4.25 Gbps
- Multimode and singlemode I/O boards available
- Modular, field-upgradeable and hot-swappable design
- Dual redundant and hot-swappable power supplies
- Hot-swappable I/O boards
- IP Link® Ethernet monitoring and control
- Multi-rate SDI board available
- Global presets for storing commonly used switching configurations
- I/O rooming and grouping
- RS-232 and RS-422 serial control

The Extron FOX 4G Matrix 3200 is a high performance, modular fiber optic matrix switcher for systems requiring complete, end-to-end digital A/V signal transmission and routing over fiber optic cable. Using a modular, card cage design, the matrix is expandable from 8x8 up to 32x32, and provides digital switching for data rates up to 4.25 Gbps. With hot-swappable input/output boards and fully redundant power supplies as well as real-time system monitoring, the FOX 4G Matrix 3200 is ideal for mission-critical environments requiring 24-hour reliability and continuous operation.

DESCRIPTION

The Extron **FOX 4G Matrix 3200** is a high performance, modular fiber optic matrix switcher for complete, end-to-end digital A/V signal transmission and routing over fiber optic cable. The FOX 4G Matrix 3200 is expandable in sizes from 8x8 up to 32x32, and is fully compatible with the FOX Series of fiber optic transmitters and receivers. Supporting rates up to 4.25 Gbps, it accepts and routes standard definition video, high resolution computer-video, DVI-D, and multi-rate SDI. Equipped with the integration-friendly features common to Extron matrix switchers, together with hot-swappable I/O boards and fan assembly, real-time system monitoring, and redundant, hot-swappable power supplies, the FOX 4G Matrix 3200 delivers highly reliable, enterprise-wide switching of fiber optic A/V and control signals for any mission-critical environment.


Tx (output) portion
Rx (input) portion
Output 1
Input 1
Switch as independent input and output
Output 1 or Input 1
Linked ports switch together as a single input or output

8x8 I/O board - multimode and singlemode versions available.

Fiber Matrix Architecture

The FOX 4G Matrix 3200 is a modular design featuring four board slots. Each slot accepts a FOX 4G Matrix 8x8 I/O Board having eight ports populated with LC-type fiber optic connectors. Two versions of the board are available. The FOX 4G Matrix 8x8 I/O Board - MM supports multimode fiber at 850 nm, which is typically used within buildings or facilities with moderate-range transmission distances. The FOX 4G Matrix 8x8 I/O Board - SM supports singlemode as well as multimode fiber at 1310 nm. Singlemode fiber offers long-range transmission capability over extreme distances of several kilometers or miles. It is used in very large facilities such as hospitals and stadiums, and for connecting over very long distances between facilities such as university campuses.

The FOX 4G Matrix 3200 can be configured with all or some of the board slots occupied. The I/O boards are hot-swappable and may be added at any time in the field for easy and quick upgradeability or expansion. The FOX 4G Matrix 3200 also accommodates any combination of singlemode or multimode I/O boards. This can allow, for example, a multimode fiber link input to the matrix switcher from a multimode transmitter, and a singlemode output from the switcher for transmission over extreme distances to a singlemode receiver.

I/O Configuration

Each fiber optic port comprises two individual fiber links. In the standard I/O configuration for the FOX 4G Matrix 3200, these links are defined as a separate input and a separate output. Therefore, up to 32 single fiber link inputs and 32 single fiber link outputs are possible when configuring and controlling the matrix switcher with the Extron control software.

However, through RS-232 serial control, each fiber optic connection can also be defined as a "linked" input or output, with the two fiber optic links supporting bi-directional capabilities for a FOX Series product. Any group of linked connections, anywhere on the rear panel can function as inputs or outputs, enabling the creation of a custom I/O configuration. For example, a FOX 4G Matrix 3200, populated with two I/O boards and 16 available linked connections, may be operated as a 12x4 bi-directional switcher. In the standard I/O configuration, these same two boards would support 16x16 switching with single fiber link inputs and outputs. For added flexibility, the FOX 4G Matrix 3200 can function with a combination of linked and single fiber link inputs and outputs.

Familiar, Integrator Friendly Matrix Switcher Features

The front panel offers the QS-FPC™ - QuickSwitch Front Panel Controller with tri-color backlit buttons as a standard feature. Once the I/O virtualization has been defined, up to four smaller sub-switchers can be created by dividing up the matrix. For example, a portion of the switching may be dedicated to HD-SDI signals. Additionally, 32 memory presets are available for saving and recalling commonly used input and output ties. Furthermore, a rooming feature enables the creation of 10 rooms by groups of outputs, each with separate presets.

Self-Monitoring and Hot-Swappable

The FOX 4G Matrix 3200 is designed for optimum performance and reliability in applications requiring continuous operations 24 hours a day, 7 days a week, such as in government, military, and medical installations. A real-time monitoring system continuously provides self-diagnostics of the I/O boards, fiber links, power supplies, internal fans, and general functions of the switcher. LED indicators on each I/O board provide a quick verification of input signal presence as well as the status of fiber links with the transmitters and receivers. The FOX 4G Matrix 3200 can be configured to trigger an external control system or generate e-mail alerts when an inbound fiber link has been lost.

Each I/O board is hot-swappable so that the matrix switcher can be serviced or reconfigured without interrupting all signal routing by powering down the unit. The FOX 4G Matrix 3200 also features a hot-swappable fan assembly, and dual redundant and hot-swappable power supplies to ensure continuous, uninterrupted power.

Control

The FOX 4G Matrix 3200 offers convenient user control through the standard front panel controller. Remote system access for configuration, I/O virtualization, operation, and monitoring is available through the front and rear panel RS-232 serial control ports and IP Link Ethernet control. The FOX 4G Matrix 3200 is also compatible with the MKP 3000 X-Y Remote Control Panel that provides a convenient user interface to the matrix switcher from remote locations.

DESCRIPTION (Cont.)

Multi-Rate SDI Signal Switching and Distribution
The FOX 4G Matrix 3G SDI I/O Board is available as an option for the FOX 4G Matrix 3200, and enables connection to local multi-rate SDI-equipped devices. This board offers an 8x8 configuration for switching and distribution of multi-rate SDI signals up to 2.97 Gbps, including SDI, HD-SDI, and 3G-SDI. With this board, the FOX 4G Matrix 3200 can be configured as a dedicated multi-rate SDI matrix switcher up to 32x32, or for a combination of multi-rate SDI and fiber optic matrix switching. The FOX 4G Matrix 3G SDI I/O Board is compliant with SMPTE 259M, 292M, 424M, and ITU digital video standards. The board is hot-swappable, and each input and output is individually buffered to maximize performance with virtually no crosstalk. To optimize SDI signal transmission to and from the board, input signals are automatically equalized, and output signals are reclocked. The FOX 4G Matrix 3200 provides separate bi-level and tri-level references for correct vertical interval switch timing.

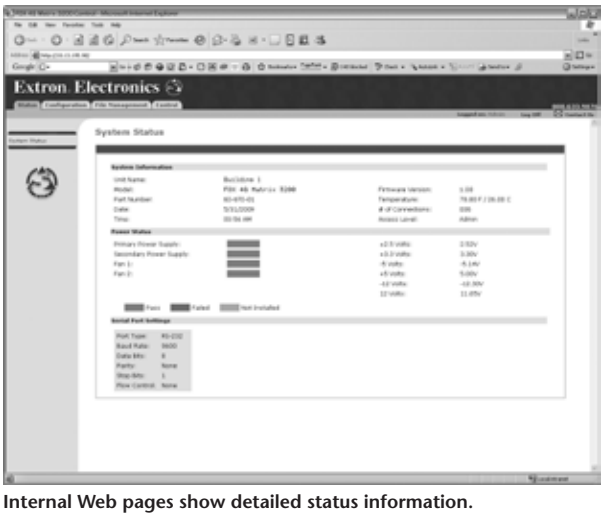
FOX 4G Matrix 3200 HD-SDI Board

The FOX 4G Matrix 3G SDI I/O Board enables a local BNC connection to the FOX HD-SDI Fiber Optic Extender for Multi-Rate SDI. Incoming multi-rate SDI signals from the FOX HD-SDI can then be routed to the board's BNC outputs, or through the fiber optic outputs to remote FOX HD-SDI units. Similarly, incoming fiber optic signals from the FOX HD-SDI can be output on fiber or BNC. In broadcast and production applications, a multi-rate SDI-equipped FOX 4G Matrix 3200, together with several FOX HD-SDI units, offers expanded opportunities for system integration. For example, the FOX 4G Matrix 3200 can be used to route signals to and from local editing equipment, while also providing the capability to receive or transmit multi-rate SDI signals very long distances to devices in remote locations, such as cameras and production monitors.

MKP 3000
X-Y Remote Control Panel

FEATURES

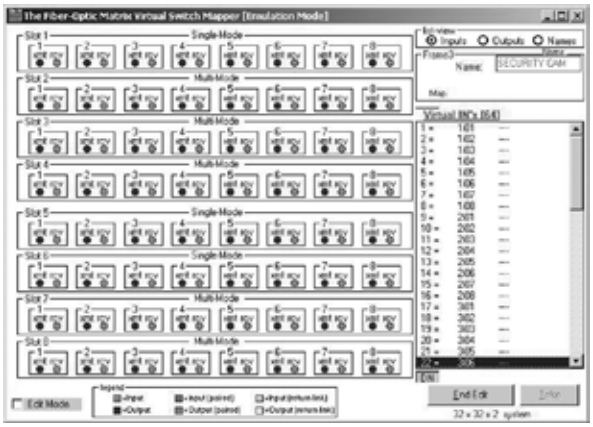
- **I/O sizes from 8x8 to 32x32**
- **High speed digital switching up to 4.25 Gbps** – The FOX 4G Matrix 3200 offers up to 4.25 Gbps digital switching capability for routing audio, control, and video signals in multiple formats with uncompressed, pixel-for-pixel throughput. This level of performance assures compatibility up to the highest source resolutions, including RGB computer-video, DVI, and multi-rate SDI signals.
- **Multimode and singlemode I/O boards available** – The FOX 4G Matrix 3200 is configurable with a mix of multimode and singlemode versions of the FOX 4G Matrix 8x8 I/O Boards, so that both short and long haul transmission can be supported.
- **Multi-rate SDI I/O board available** – The FOX 4G Matrix 3200 can be configured with the FOX 4G Matrix 3G SDI I/O Board for local connection to multi-rate SDI-equipped devices. This board provides 8x8 routing of multi-rate SDI signals up to 2.97 Gbps, including SDI, HD-SDI, and 3G-SDI. The FOX 4G Matrix 3200 can be configured as a fully dedicated multi-rate SDI matrix switcher, or a combination of multi-rate SDI and fiber optic matrix switching. The FOX 4G Matrix 3G SDI I/O Board is compliant with SMPTE 259M, 292M, 424M, and ITU digital video standards.
- **Modular, field-upgradeable and hot-swappable design** – The FOX 4G Matrix 3200 provides substantial flexibility, expandability, and affordability by allowing users to select the configuration required for their systems. Additional input and output boards may be added at any time for easy and quick upgradeability or expansion. Hot-swappable components allow the user to replace an I/O board, fan assembly, or power supply at any time—no need to power down the switcher. This is especially useful for mission-critical applications that require continuous operation of the FOX 4G Matrix 3200.
- **Dual redundant and hot-swappable power supplies** – Primary and back-up power supplies provide added reliability for critical applications.
- **Video genlock** – When used with the FOX 4G Matrix 3G SDI I/O Board, separate bi-level and tri-level references are provided for correct vertical interval switch timing for SDI and HD-SDI signals.



Internal Web pages show detailed status information.

FEATURES (Cont.)

- **Advanced computer-aided diagnostics** – Provide 24-hour self-diagnostics of input/output boards, primary and redundant power supply voltages, fiber links, and overall functional status of the matrix. Using the IP Link Ethernet or RS-232/ RS-422 communications port, status monitoring is possible for off-site or unmanned locations, such as government, military, medical, or any other sensitive, 24 hour a day, 7 day a week environments.
- **Input video signal detection** – The FOX 4G Matrix 3200 verifies active light sources by polling all connections for input reception and output transmission. The resulting information is viewable within the internal Web pages, and is easily obtained by third party control systems.
- **Status LED indicators for fiber link status** – LEDs on each I/O board verify active fiber links with the transmitters and receivers.
- **Alarm notification for fiber link loss** – The FOX 4G Matrix 3200 can be set up to trigger an external control system, or generate e-mail alerts, for immediate notification when an inbound fiber link has been lost.
- **Two AC power inputs** – For added power reliability, some 24-hour environments offer two separate AC power sources, one as the primary source and the second for redundancy. The FOX 4G Matrix 3200 offers two AC power inputs for continuous connection to both power sources.
- **Industry standard LC connectors provide reliable physical connectivity and precise fiber core alignment**
- **QS-FPC - QuickSwitch Front Panel Controller with tri-color backlit buttons** – Provides a discrete button for each input and output, allowing for simple, intuitive operation. Buttons can be custom labeled for easy identification. The buttons illuminate red, green, or amber, depending on function, for ease of use in low-light environments.
- **View I/O mode** – Users can easily view which inputs and outputs are actively connected, from the front panel, RS-232 or RS-422 serial port, or IP Link Ethernet port.
- **I/O grouping** – Allows the matrix switcher to be virtually divided into smaller sub-switchers, making installation and control easier. I/O grouping allows specific outputs, like those designated for a specific video format, to be grouped together.
- **Rooming** – The FOX 4G Matrix 3200 can be configured to group selected outputs into specific "rooms," each with its own set of unique presets. A total of 10 rooms, with 10 presets per room, are available.
- **Global presets** – Frequently used I/O configurations may be saved and recalled from the QS-FPC - QuickSwitch Front Panel Controller, IP Link, or serial control. This time-saving feature allows I/O configurations to be set up and stored in memory for future use.
- **Front panel security lockout** – Prevents unauthorized use in non-secure environments. In lockout mode, a special button combination is required to operate the switcher from the front panel controller.
- **Extron control software** – For serial or Ethernet remote control from a PC, the included Windows®-based control software features a graphical, drag-and-drop interface to make I/O configuration and other customization functions simple and convenient. This software also offers an emulation mode for configuration of an offsite matrix switcher; the I/O configuration may then be saved for future downloading to the matrix switcher.



- **IP Link Ethernet monitoring and control** – The FOX 4G Matrix 3200 can be proactively monitored and managed over a LAN, WAN, or the Internet, using standard TCP/IP protocols. IP Link provides for remote selection of input and output ties, system set-up and configuration, and advanced system diagnostics.
- **RS-232 and RS-422 serial control port** – Using serial commands, the FOX 4G Matrix 3200 can be controlled and configured via the included Windows-based control software, or integrated into third-party control systems. Extron products use the SIS™ - Simple Instruction Set command protocol, a set of basic ASCII code commands that allow for quick and easy programming. The RS-232 and RS-422 port also makes it easy to install firmware updates.
- **Front panel configuration port** – A front panel serial port allows easy accessibility for configuring the FOX 4G Matrix 3200 without having to access the rear panel.
- **Rack-mountable 4U, full rack width metal enclosure**

SPECIFICATIONS

NOTE: The I/O boards are class 1 laser products. They meet the safety regulations of IEC-60825, FDA 21 CFR 1040.10, and FDA 21 CFR 1040.11.

OPTICAL SPECIFICATIONS

Number/type ..... 8 single mode or 8 multimode fiber optic inputs and outputs (8 TX and 8 RX) per I/O card
Connectors ..... 8 bidirectional LC connectors per I/O card
Operating distance ..... 30 km (18.75 miles) with singlemode (SM) cables with an Extron singlemode distribution amplifier or transmitter/receiver
300 m (985') with 62.5 µm multimode (MM) cables with an Extron multimode TX/RX unit
1 km (3280') with 50 µm multimode (MM) cables with an Extron multimode TX/RX unit
2 km (6561') with 50 µm, 2000 MHz bandwidth, laser-optimized multimode (MM) cables with an Extron multimode TX/RX unit

NOTE: Operating distance is approximate. These are typical distances. The maximum distance may be greater than these typical numbers depending on factors such as fiber type, fiber bandwidth, connector splicing, losses, modal or chromatic dispersion, environmental factors, and kinks.

Nominal peak wavelength ..... 850 nm for multimode (MM), 1310 nm for single mode (SM)

Transmission power
Singlemode ..... -5 dBm, typical
Multimode ..... -5 dBm, typical
Maximum receiver sensitivity
Singlemode ..... -18 dBm, typical
Multimode ..... -12 dBm, typical
Optical loss budget
Singlemode ..... 13 dB, maximum
Multimode ..... 7 dB, maximum
Maximum channel data rate ..... 4.25 Gbps

VIDEO — FIBER OPTIC

Routing ..... 8 x 8 up to 32 x 32 unidirectional (TX) matrix
Gain ..... Unity
Pixel data bit depth ..... 8 bits per channel, 3 channels (R, G, B)
Maximum resolution ..... 1600x1200 @ 60 Hz, digitized pixel for pixel; higher resolutions up to 2048x1120, undersampled

VIDEO/AUDIO INPUT — FIBER OPTIC

Number/signal type ..... 8 to 32 fiber optic signals
Connectors ..... 8 LC connectors per I/O card

VIDEO/AUDIO OUTPUT— FIBER OPTIC

Number/signal type ..... 8 to 32 fiber optic signals
Connectors ..... 8 LC connectors per I/O card

DIGITAL VIDEO — SDI/HD-SDI

Maximum data rate ..... 2.97 Gbps
Operation standards ..... SMPTE 292M, SMPTE 259M, SMPTE 424M, ITU-RBT.601, ITU-RBT.1120

DIGITAL VIDEO INPUT— SDI/HD-SDI

Number/signal type ..... 8 single-link SDI, HD-SDI; or dual-link HD-SDI per board
Equalization ..... Automatic
Input cable equalization distance
HD-SDI
Extron SHR, Belden 1694A cable ..... 492' (150 m)
Extron HR, Belden 1505A cable ..... 328' (100 m)
SDI
Extron SHR, Belden 1694A cable ..... 984' (300 m)
Extron HR, Belden 1505A cable ..... 656' (200 m)

NOTE: The transmission distance varies depending on the signal resolution and on the type of cable, graphic card, and display used in the system.

DIGITAL VIDEO OUTPUT — SDI/HD-SDI

Re-clocking ..... Automatic, or use available bypass mode for nonstandard rates
Jitter ..... <0.2 UI
Rise and fall time (20-80%) ..... 600 ps ±100 ps

CONTROL/REMOTE — SWITCHER

Serial control port ..... 1 bidirectional RS-232 or RS-422, 9-pin female D connector (rear panel)
1 bidirectional RS-232, 2.5 mm mini stereo jack (front panel)
Baud rate and protocol ..... 9600 to 115200 baud, 9600 baud (default), 8 data bits, 1 stop bit, no parity
Ethernet data rate ..... 10/100Base-T, half/full duplex with autodetect
Ethernet protocol ..... ARP, ICMP (ping), IP, TCP, UDP, DHCP, HTTP, SMTP, Telnet
Program control ..... Extron's control/configuration program for Windows®
Extron's Simple Instruction Set (SIS™)
Microsoft® Internet Explorer® ver. 6 or higher, Telnet

GENERAL

Power* ..... 2 (positive-negative), 100 VAC to 240 VAC, 50-60 Hz; internal, 175 watts each, hot-swappable
Enclosure without cards: 35 watts at 115 VAC, 60 Hz
Enclosure fully loaded with 4 cards: 115 watts at 115 VAC, 60 Hz
Each module card: 10 watts at 115 VAC, 60 Hz
*A redundant power supply is standard.
Temperature/humidity ..... Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing
Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling ..... Fan, right to left (as viewed from front panel)

Mounting
Rack mount ..... Yes
Enclosure type ..... Metal
Enclosure dimensions ..... 7.0" H x 17.0" W x 12" D (4U high, full rack wide)
(17.8 cm H x 43.2 cm W x 30.5 cm D)
(Depth excludes connectors and buttons. Width excludes integrated rack ears.)

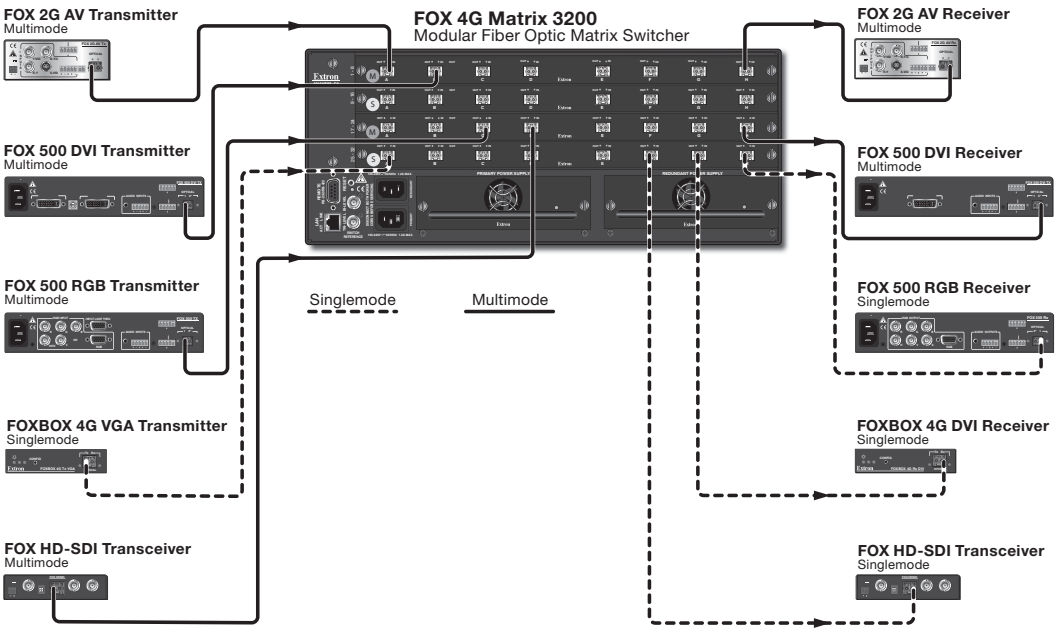
Product weight (fully loaded) ..... 24 lbs (10.9 kg)
Shipping weight ..... 30 lbs (14 kg)
DIM weight
USA/Canada ..... 25 lbs (12 kg)
International ..... 25 lbs (12 kg)
Vibration ..... ISTA 1A in carton (International Safe Transit Association)

Regulatory compliance
Safety ..... CE, c-UL, UL
EMI/EMC ..... CE, C-tick, FCC Class A, ICES, VCCI
MTBF ..... 30,000 hours
Warranty ..... 3 years parts and labor
NOTE: All nominal levels are at ±10%.
NOTE: Specifications are subject to change without notice.

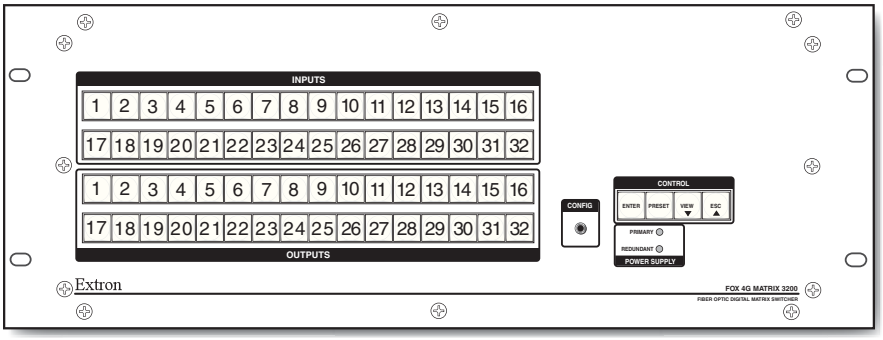
Model	Version Description	Part Number
FOX 4G Matrix 3200	Frame	60-970-01
FOX 4G Matrix 8x8 I/O Board - MM	Multimode	70-791-01
FOX 4G Matrix 8x8 I/O Board - SM	Singlemode	70-791-02
FOX 4G Matrix 8x8 I/O Board - 3G SDI	Multi-Rate SDI	70-792-01

Specifications are subject to change without notice.

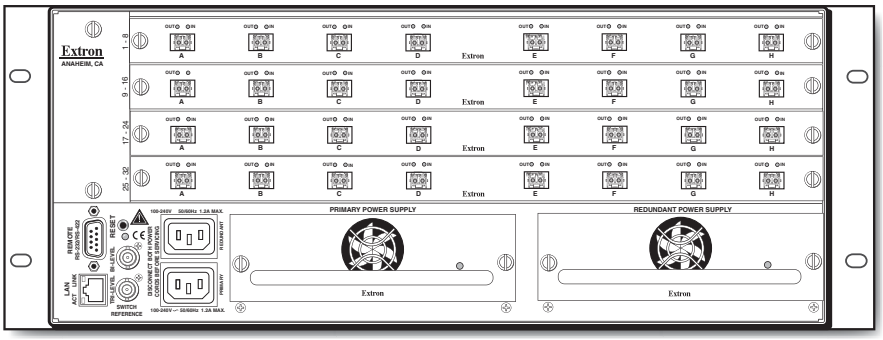
APPLICATION DIAGRAM



PANEL DRAWINGS


INPUTS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
OUTPUTS
CONFIG
CONTROL
ENTER
PRESET
VIEW
ESC
PRIMARY
REDUNDANT
POWER SUPPLY
Extron
FOX 4G MATRIX 3200
FIBER OPTIC DIGITAL MATRIX SWITCHER

Front



Back

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